

## CoE 197-S ME 8 Activity 6

### 1. Listing networks

```
PS C:\WINDOWS\system32> docker network ls
NETWORK ID          NAME                DRIVER              SCOPE
f7a557766697        bridge             bridge             local
cae299da2be1        host              host              local
7146f8198402        none              null              local
```

### 2. The default `bridge` network

```
PS C:\WINDOWS\system32> docker run --rm -d --name dummy bluenavigator/ping:1.0
294e95e34cada4a5c433c26dbf91a14db468c5a4f1fd0f0759f43205ed2c31d0
PS C:\WINDOWS\system32> docker network inspect bridge
[
  {
    "Name": "bridge",
    "Id": "f7a557766697c9e1b791bf908cbe4132a6c4cdcc00c28fb94f49d580be4e6822",
    "Created": "2021-06-05T19:49:57.7806863Z",
    "Scope": "local",
    "Driver": "bridge",
    "EnableIPv6": false,
    "IPAM": {
      "Driver": "default",
      "Options": null,
      "Config": [
        {
          "Subnet": "172.17.0.0/16",
          "Gateway": "172.17.0.1"
        }
      ]
    },
    "Internal": false,
    "Attachable": false,
    "Ingress": false,
    "ConfigFrom": {
      "Network": ""
    },
    "ConfigOnly": false,
    "Containers": {
      "294e95e34cada4a5c433c26dbf91a14db468c5a4f1fd0f0759f43205ed2c31d0": {
        "Name": "dummy",
        "EndpointID": "195ab23e7e7efb41744bec71eb7234d01cca45becdc7f2d8edb74bc6d968c3b5",
        "MacAddress": "02:42:ac:11:00:02",
        "IPv4Address": "172.17.0.2/16",
        "IPv6Address": ""
      }
    },
    "Options": {
      "com.docker.network.bridge.default_bridge": "true",
      "com.docker.network.bridge.enable_icc": "true",
      "com.docker.network.bridge.enable_ip_masquerade": "true",
      "com.docker.network.bridge.host_binding_ipv4": "0.0.0.0",
      "com.docker.network.bridge.name": "docker0",
      "com.docker.network.driver.mtu": "1500"
    },
    "Labels": {}
  }
]
```

```

PS C:\WINDOWS\system32> docker run --rm -d -e PING_TARGET=172.17.0.2 --name pinger bluenavigator/ping:1.0
be7b2297d47c227fe2d99978ac4b9f73043e7a59ecedbe9232d0c819dca9b796
PS C:\WINDOWS\system32> docker ps
CONTAINER ID   IMAGE                      COMMAND                  CREATED        STATUS        PORTS        NAMES
be7b2297d47c   bluenavigator/ping:1.0    "sh -c 'ping $PING_T..." 6 seconds ago  Up 5 seconds                pinger
294e95e34cad    bluenavigator/ping:1.0    "sh -c 'ping $PING_T..." About a minute ago Up About a minute                dummy
PS C:\WINDOWS\system32> docker logs pinger
PING 172.17.0.2 (172.17.0.2) 56(84) bytes of data.
64 bytes from 172.17.0.2: icmp_seq=1 ttl=64 time=0.099 ms
64 bytes from 172.17.0.2: icmp_seq=2 ttl=64 time=0.109 ms
64 bytes from 172.17.0.2: icmp_seq=3 ttl=64 time=0.162 ms
64 bytes from 172.17.0.2: icmp_seq=4 ttl=64 time=0.107 ms
64 bytes from 172.17.0.2: icmp_seq=5 ttl=64 time=0.114 ms
64 bytes from 172.17.0.2: icmp_seq=6 ttl=64 time=0.106 ms
64 bytes from 172.17.0.2: icmp_seq=7 ttl=64 time=0.063 ms
64 bytes from 172.17.0.2: icmp_seq=8 ttl=64 time=0.109 ms
64 bytes from 172.17.0.2: icmp_seq=9 ttl=64 time=0.071 ms
64 bytes from 172.17.0.2: icmp_seq=10 ttl=64 time=0.043 ms
64 bytes from 172.17.0.2: icmp_seq=11 ttl=64 time=0.077 ms
64 bytes from 172.17.0.2: icmp_seq=12 ttl=64 time=0.059 ms
64 bytes from 172.17.0.2: icmp_seq=13 ttl=64 time=0.109 ms
64 bytes from 172.17.0.2: icmp_seq=14 ttl=64 time=0.106 ms
64 bytes from 172.17.0.2: icmp_seq=15 ttl=64 time=0.105 ms
64 bytes from 172.17.0.2: icmp_seq=16 ttl=64 time=0.106 ms
64 bytes from 172.17.0.2: icmp_seq=17 ttl=64 time=0.042 ms
64 bytes from 172.17.0.2: icmp_seq=18 ttl=64 time=0.116 ms
64 bytes from 172.17.0.2: icmp_seq=19 ttl=64 time=0.074 ms
64 bytes from 172.17.0.2: icmp_seq=20 ttl=64 time=0.041 ms
64 bytes from 172.17.0.2: icmp_seq=21 ttl=64 time=0.107 ms
64 bytes from 172.17.0.2: icmp_seq=22 ttl=64 time=0.106 ms
PS C:\WINDOWS\system32> docker stop pinger
pinger
PS C:\WINDOWS\system32> docker run --rm -d -e PING_TARGET=dummy --name pinger bluenavigator/ping:1.0
69a959e3f34384f60b00150d8df4dbfd4a9bf8e25245e912b86bdc92273cc47a
PS C:\WINDOWS\system32> docker ps
CONTAINER ID   IMAGE                      COMMAND                  CREATED        STATUS        PORTS        NAMES
294e95e34cad    bluenavigator/ping:1.0    "sh -c 'ping $PING_T..." 5 minutes ago  Up 5 minutes                dummy
PS C:\WINDOWS\system32> docker stop dummy
dummy

```

### 3. Managing custom networks

```

PS C:\WINDOWS\system32> docker network create skynet
7cee4a75572631d6346d76012aeada10c05b7f21878b9d0a6142e1a52aa44e4
PS C:\WINDOWS\system32> docker network ls
NETWORK ID     NAME      DRIVER    SCOPE
f7a557766697   bridge    bridge    local
cae299da2be1   host      host      local
7146f8198402   none      null      local
7cee4a755726   skynet    bridge    local
PS C:\WINDOWS\system32> docker network inspect skynet
[
  {
    "Name": "skynet",
    "Id": "7cee4a75572631d6346d76012aeada10c05b7f21878b9d0a6142e1a52aa44e4",
    "Created": "2021-06-05T20:31:10.3235464Z",
    "Scope": "local",
    "Driver": "bridge",
    "EnableIPv6": false,
    "IPAM": {
      "Driver": "default",
      "Options": {},
      "Config": [
        {
          "Subnet": "172.18.0.0/16",
          "Gateway": "172.18.0.1"
        }
      ]
    },
    "Internal": false,
    "Attachable": false,
    "Ingress": false,
    "ConfigFrom": {
      "Network": ""
    },
    "ConfigOnly": false,
    "Containers": {},
    "Options": {},
    "Labels": {}
  }
]

```

#### 4. Adding containers to a network

```
PS C:\WINDOWS\system32> docker run --rm -d --network skynet --name dummy bluenavigator/ping:1.0
46d59089f0eb59cb7894245a6a66ab4fca928db9833ea039425455b56cea0351
PS C:\WINDOWS\system32> docker run --rm -d --network skynet -e PING_TARGET=dummy --name pinger bluenavigator/ping:1.0
43a230fc3cff74865a4a499b835cda032e2177389608e153c32030b88aed6a84
PS C:\WINDOWS\system32> docker logs pinger
PING dummy (172.18.0.2) 56(84) bytes of data.
64 bytes from dummy.skynet (172.18.0.2): icmp_seq=1 ttl=64 time=0.318 ms
64 bytes from dummy.skynet (172.18.0.2): icmp_seq=2 ttl=64 time=0.048 ms
64 bytes from dummy.skynet (172.18.0.2): icmp_seq=3 ttl=64 time=0.120 ms
64 bytes from dummy.skynet (172.18.0.2): icmp_seq=4 ttl=64 time=0.065 ms
64 bytes from dummy.skynet (172.18.0.2): icmp_seq=5 ttl=64 time=0.200 ms
64 bytes from dummy.skynet (172.18.0.2): icmp_seq=6 ttl=64 time=0.118 ms
64 bytes from dummy.skynet (172.18.0.2): icmp_seq=7 ttl=64 time=0.046 ms
64 bytes from dummy.skynet (172.18.0.2): icmp_seq=8 ttl=64 time=0.118 ms
64 bytes from dummy.skynet (172.18.0.2): icmp_seq=9 ttl=64 time=0.118 ms
64 bytes from dummy.skynet (172.18.0.2): icmp_seq=10 ttl=64 time=0.046 ms
PS C:\WINDOWS\system32> docker stop pinger
pinger
PS C:\WINDOWS\system32> docker stop dummy
dummy
```

#### 5. Connecting between containers in a network

```
PS C:\WINDOWS\system32> docker run --rm -d --name widgetdb --network skynet -p 5432 -e POSTGRES_PASSWORD=pass postgres
e9758ded9b73fb4687ea274058b24ef65acaf4acb7592f3efbc223558170132c
PS C:\WINDOWS\system32> docker run --rm -d --name gadgetdb --network skynet -p 5432 -e POSTGRES_PASSWORD=pass postgres
ece912aa696c4f65e9f2aa4e1b10d68e68ce299ac9b425afe4eba019742a8ff1
PS C:\WINDOWS\system32> docker ps
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS                               NAMES
ece912aa696c   postgres   "docker-entrypoint.s..." 4 seconds ago Up 3 seconds  0.0.0.0:51670->5432/tcp             gadgetdb
e9758ded9b73   postgres   "docker-entrypoint.s..." 36 seconds ago Up 35 seconds  0.0.0.0:51668->5432/tcp             widgetdb
PS C:\WINDOWS\system32> docker exec -it widgetdb /bin/bash
root@e9758ded9b73:/# psql -U postgres
psql (13.3 (Debian 13.3-1.pgdg100+1))
Type "help" for help.

postgres=# \q
root@e9758ded9b73:/# psql -U postgres -h gadgetdb
Password for user postgres:
psql (13.3 (Debian 13.3-1.pgdg100+1))
Type "help" for help.

postgres=# \q
root@e9758ded9b73:/# exit
exit
PS C:\WINDOWS\system32> docker stop widgetdb gadgetdb
widgetdb
gadgetdb
PS C:\WINDOWS\system32> docker ps
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS                               NAMES
```

#### 6. Binding ports to the host

```
PS C:\WINDOWS\system32> docker run --rm -d --name widgetdb --network skynet -p 5432:5432 -e POSTGRES_PASSWORD=pass postgres
419ee7b521893584ea8acb732e21dda076ea77eb3821d838ab2878af1ddd1884
PS C:\WINDOWS\system32> docker exec -it widgetdb /bin/bash
root@419ee7b52189:/# psql -U postgres -h localhost
psql (13.3 (Debian 13.3-1.pgdg100+1))
Type "help" for help.

postgres=# \q
root@419ee7b52189:/# exit
exit
PS C:\WINDOWS\system32> docker stop widgetdb
widgetdb
PS C:\WINDOWS\system32>
```